

(12)特許協力条約に基づいて公開された国際出願

(19) 世界知的所有権機関  
国際事務局(43) 国際公開日  
2004年3月4日 (04.03.2004)

PCT

(10) 国際公開番号  
WO 2004/018669 A1(51) 国際特許分類<sup>7</sup>: C12N 15/09,  
1/15, 1/19, 1/21, 5/10, 9/12, A61K 31/7088, 35/76, 38/45,  
39/395, 45/00, 48/00, A61P 3/04, 3/06, 3/10, 9/00, 9/10,  
9/12, 19/06, 25/28, 43/00, C07K 16/40, C12Q 1/02, 1/48,  
1/68, G01N 33/15, 33/50, 33/53, 33/566

(21) 国際出願番号: PCT/JP2003/010535

(22) 国際出願日: 2003年8月20日 (20.08.2003)

(25) 国際出願の言語: 日本語

(26) 国際公開の言語: 日本語

(30) 優先権データ:  
特願2002-240092 2002年8月21日 (21.08.2002) JP  
特願2003-23295 2003年1月31日 (31.01.2003) JP(71) 出願人 (米国を除く全ての指定国について): 株式会社  
プロテイン・エクスプレス (PROTEINEXPRESS  
CO., LTD.) [JP/JP]; 〒288-0041 千葉県銚子市中央町  
2-11 Chiba (JP).

(71) 出願人 および

(72) 発明者: 竹森 洋 (TAKEMORI, Hiroshi) [JP/JP]; 〒565-  
0871 大阪府吹田市山田丘 2-2 大阪大学内 Osaka (JP).  
岡本 光弘 (OKAMOTO, Mitsuhiro) [JP/JP]; 〒565-0871  
大阪府吹田市山田丘 2-2 大阪大学内 Osaka (JP).(74) 代理人: 関根 武, 外 (SEKINE, Takeshi et al.); 〒169-  
0075 東京都新宿区高田馬場1-20-10-203 進歩国際特  
許事務所 Tokyo (JP).(81) 指定国 (国内): AE, AG, AL, AM, AT, AU, AZ, BA, BB,  
BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK,  
DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,  
ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,  
LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI,  
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG,  
SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VC, VN, YU, ZA, ZM, ZW.(84) 指定国 (広域): ARIPO 特許 (GH, GM, KE, LS, MW, MZ,  
SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア特許 (AM,  
AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ特許  
(AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB,  
GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR),  
OAPI 特許 (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,  
ML, MR, NE, SN, TD, TG).

添付公開書類:

— 国際調査報告書

2文字コード及び他の略語については、定期発行される  
各PCTガゼットの巻頭に掲載されている「コードと略語  
のガイダンスノート」を参照。

(54) Title: SALT-INDUCIBLE KINASES 2 AND USE THEREOF

(54) 発明の名称: 塩誘導性キナーゼ2及びその用途

(57) Abstract: A polypeptide which comprises an amino acid sequence represented by SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6,  
SEQ ID NO:8, SEQ ID NO:10 or SEQ ID NO:12. This polypeptide is useful as a preventive or a remedy for a disease in which a  
metabolic error in adipocytes, etc. participates.(57) 要約: 本発明のポリペプチドは、配列番号: 2、配列番号: 4、配列番号: 6、配列番号: 8、配列番号:  
10又は配列番号: 12で表わされるアミノ酸配列よりなるポリペプチドである。本発明のポリペプチドは、脂肪  
細胞等における代謝異常が関与する疾患の予防・改善薬等として有用である。

BEST AVAILABLE COPY



WO 2004/018669 A1

## INTERNATIONAL SEARCH REPORT

International application No.

JP03/10535

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl<sup>7</sup> C12N15/09, 1/15, 1/19, 1/21, 5/10, 9/12, A61K31/7088,  
35/76, 38/45, 39/395, 45/00, 48/00, A61P3/04, 3/06, 3/10,  
9/00, 9/10, 9/12, 19/06, 25/28, 43/00, C07K16/40,

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl<sup>7</sup> C12N15/09, 1/15, 1/19, 1/21, 5/10, 9/12, A61K31/7088,  
35/76, 38/45, 39/395, 45/00, 48/00, A61P3/04, 3/06, 3/10,  
9/00, 9/10, 9/12, 19/06, 25/28, 43/00, C07K16/40,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubMed, BIOSIS/WPI (DIALOG), JSTPlus (JOIS), SwissProt/PIR/GeneSeq,  
GenBank/EMBL/DDBJ/GeneSeq

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No.   |
|-----------|---|---|
| X/A       | Zhi-nong Wang et al., Cloning of a novel kinase (SIK) of the SNF1/AMPK family from high salt diet-treated rat adrenal., FEBS Letters, 1999, Vol.453, pages 135 to 139 | 1-8, 11-15,<br>19, 20, 23,<br>32-37, 39-44,<br>46, 48, 50, 52,<br>55-59, 61-68,<br>70/9, 10,<br>16-18, 21, 22,<br>24-27, 38, 45,<br>47, 49, 51, 54,<br>60, 69 |

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search  
14 November, 2003 (14.11.03)

Date of mailing of the international search report  
02 December, 2003 (02.12.03)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

## INTERNATIONAL SEARCH REPORT

International Application No.

JP03/10535

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.   |
|-----------|--|---|
| X/A       | WO 01/12659 A2 (GERMAN HUMAN GENOME PROJECT),<br>22 February, 2001 (22.02.01),<br>& EP 1248798 A2  | 1-8, 11-15,<br>19, 20, 23,<br>32-37, 39-44,<br>46, 48, 50, 52,<br>55-59, 61-68,<br>70/9, 10,<br>16-18, 21, 22,<br>24-27, 38, 45,<br>47, 49, 51, 54,<br>60, 69 |
| X/A       | WO 00/73469 A2 (SUGEN INC.),<br>07 December, 2000 (07.12.00),<br>& EP 1180151 A3 & JP 2003-501038 A  | 1-8, 11-15,<br>19, 20, 23,<br>32-37, 39-44,<br>46, 48, 50, 52,<br>55-59, 61-68,<br>70/9, 10,<br>16-18, 21, 22,<br>24-27, 38, 45,<br>47, 49, 51, 54,<br>60, 69 |
| X/A       | WO 01/81555 A2 (INCYTE GENOMICS INC.),<br>01 November, 2001 (01.11.01),<br>& US 2002/0026226 A1 & EP 1297150 A2  | 1-8, 11-15,<br>19, 20, 23,<br>32-37, 39-44,<br>46, 48, 50, 52,<br>55-59, 61-68,<br>70/9, 10,<br>16-18, 21, 22,<br>24-27, 38, 45,<br>47, 49, 51, 54,<br>60, 69 |
| P,X       | Horike N. et al., Adipose-specific expression,<br>phosphorylation of Ser794 in insulin receptor<br>substrate-1, and activation in diabetic animals<br>of salt-inducible kinase-2., J.Biol.Chem., 16<br>May, 2003 (16.05.03), Vol.278, No.20, pages<br>18440 to 18447 | 1-27, 32-52,<br>54-70   |

# INTERNATIONAL SEARCH REPORT

International application No.

JP03/10535

Continuation of Box No.II of continuation of first sheet(1)

## Reference:

Zhi-nong Wang, et al., Cloning of a novel kinase (SIK) of the SNF1/AMPK family from high salt diet-treated rat adrenal.  
FEBS Letters, 1999, vol.453, p.135-139

A salt-inducible kinase which is a protein having an autophosphorylation ability is described in the above document. Thus, no technical relationship having the same "special technical feature" can be found out merely because of agreeing in such a kinase. (The term "special technical feature" as used herein means a technical feature that defines a contribution which each of the claimed inventions, considered as a whole, makes over the prior art. (See, if needed, Rule 13.2 under the Regulation of Patent Cooperation Treaty.))

Therefore, the invention relating to "SIK2", the invention relating to "a protein having an autophosphorylation ability" and the invention relating to "a salt-inducible kinase" in the present application cannot be considered as a group of inventions so linked as to form a single general inventive concept. Such being the case, the present case has 3 inventions.

## Continuation of A. CLASSIFICATION OF SUBJECT MATTER (International Patent Classification (IPC))

Int.Cl<sup>7</sup> C12Q1/02, 1/48, 1/68, G01N33/15, 33/50, 33/53, 33/566

(According to International Patent Classification (IPC) or to both national classification and IPC)

## Continuation of B. FIELDS SEARCHED

Minimum Documentation Searched (International Patent Classification (IPC))

Int.Cl<sup>7</sup> C12Q1/02, 1/48, 1/68, G01N33/15, 33/50, 33/53, 33/566

Minimum documentation searched (classification system followed by classification symbols)

# INTERNATIONAL SEARCH REPORT

International application No.  
JP03/10535

## Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 28-31  
because they relate to subject matter not required to be searched by this Authority, namely:  
The inventions as claimed in the above claims pertain to methods for treatment of the human body by therapy as well as diagnostic methods.
2. ☒ Claims Nos.: 53.  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
Even though the statement of the description is taken into consideration, it is unknown what specific compounds are involved in the scope of the "compound" as set forth in the above claim and what are not. Therefore, no meaningful international search can be made thereon.
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
(See extra sheet.)

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.  
☒ No protest accompanied the payment of additional search fees.